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A sound alarm system to prevent traffic accidents

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ABSTRACT

A sound-based road fatality prevention system is a system that preemptively detects animal movements around the road to prevent road fatalities by attaching radar and sound-generating devices and puts the vehicle in a mode protective operation while emitting a warning tone. First, in order to identify a wild animal approaching the road, the radar unit can detect movement of the entire front of the vehicle, and the vehicle detects data all the time. The Radar detection area attached to the front of the car is flexible, and the automatically deploys on the curve, expanding the radar detection area of the on both sides of the road and in the forest. If the radar detects that an animal is about to jump into the road, it immediately emits a warning sound frequency and a horn to prevent the animal from moving. In other words, road fatality prevention systems are systems that prevent road fatalities by pre calculating the vehicle's current speed and predicted collision point with an approaching wild animal to guide the driver to the speed needed to avoid a collision, and generate an alarm sound, like the frequency of a threatening animal. There is a need to continually improve road fatality prevention systems to prevent the loss of Animals in future road fatalities

Keyword: - Road Fatality Prevention System, Vehicle, Sound Warning, Radar Separation, Threat Frequency

1. INTRODUCTION

Every driver is surprised at some point by an animal that shows up on the road.Highspeed bus drivers, especially tho se who often drive on highways, often have traffic accidents.Feral pigeons, pheasants, feral cats, elk and other anima ls often run into the windshield or front bumper of highpeed buses, or die on the wheelsis also suitable for cars. Thes e road fatalities can sometimes be dangerous enough to damage the glass of acar or cause a major accident when bra king quickly or changing lanesto avoid animals.Road deaths must also be avoided to protect animal lifebut urgent ac tion is needed to protect human life. The Roadkillaccident is a civilized accident caused bypeople dividing wildlife h abitat, repairing roads, building facilities and noisily drivingcars for their own convenience. Startled animals often cr oss the road to, finding their territory before it is built. If people thought about the territories of animalsand designed the roads according to their characteristics, there would be farfewer traffic accidents. In addition, if an accident hap pens to an animal listed as a natural monument or to an endangeredspecies, they will have to redouble their efforts to prevent road accidents that will wreak havoc on the planet.Therefore; this articleproposes a fatal accident preventio n system using sound. [1]

2. TRAFFIC ACCIDENTS

A road kill is an accident in which an animal is killed by a car while crossing the road. It's death on the road again, b ecause not only are the animals unable to detect the speed of the car, but they also haven't come to terms with the fac t that they will die when they hit the car. In South Korea, a wide variety of animals are killed in car accidents, includ ing wild animals such as deer, sambars, and raccoons, as well as pets such as dogs and cats. As many as 5,600 anima ls were killed near Mount Jirisan and another 1,000 animals traveled the short 3,000 km route in two days, according

to government and local authority reports in the 30 months since 2006.This is why countless animals are killed on 1 00,000 kilometers of roads across the country. Road kill often occurs in May when the ice age hunts for food, and in November when people hunt for the winter. Streets behind towns or in residential areas are often built out of season. More recently, an Asiatic black bear was injured in a car accident on Mount Jirisan on May 5, 2018, and an endange red goat was killed in a car accident in Uljin, Gyeongsang Province of China. North, May 6. The number of animals killed by unknown victims on the road in the country or around the world is also expected to be high, as two cases m ade headlines in two days.In Korea, the animal most affected by road mortality is the sambar. Sambar deer accounte d for an overwhelming 9,078 road kills over the past five years. 1088 raccoons, 198 hares, 142 wild boars, 113 wild boars, 102 badgers and 58 ferrets. Other birds also have accidents while flying low or sitting on the road. Also on ur ban roads and remote roads, pets such as cats and dogs are often killed on the road due to careless protection by guar ds.

Table-1. Status of roadkill accidents in the last 6 years

Road＼Years	2012	2013	2014	2015	2016	2017
General National Road	3,174	7,452	8,727	9,563	12,867	15,436
Express high-way	2,360	2,188	2,039	2,545	2,247	1,884

With an average of 50 billion insects dying each year on major roads in South Korea, it's time to consider the serious ness that road deaths from cars play a major role in the destruction of life. on earth. [twenty three]

Fig -2 a) Deers exposed to roadkill b)Bears exposed to roadkill

3. EXISTING ROADKILL PREVENTION METHOD

Drivers cannot slow down on all sections of road to avoid traffic accidents. Instead, it's best to practice defensive driving and obey posted speed limits, even in areas with warning signs. If you find a wild animal driving on the roa d, honk your horn during the day, sound a warning sign at night, turn off your headlights, turn on your hazard lights, and reduce your speed as much as possible. If you turn on the headlights or turn on the lights at night, you have to temporarily stop the sight of wild animals and let them stop or attack instead of running away. So we have to shut up and honk.The reason for turning on emergency lights is to warn following vehicles of an impending emergency. I f a wild animal suddenly jumps on the highway, suddenly brakes or makes a sharp turn, it will cause secondary accidents. If you find a wild animal driving at high speed, you need to slow down as soon as possible with out posing a threat to passengers and vehicles behind you. A sudden awkward stop or sudden lane change couldcolli

de with a car following or driving into the next lane. Sometimes turning the steering wheel to the left to avoid an animal while driving in the first lane can result in a major collision with the oncoming vehicle.
Those affected by the accident could trigger not only wild animals, but also second and third follow-on accidents, raising concerns that major accidents could result in loss of life. To prevent road deaths, the Ministry of Lands, Infrastructure, Transport and Tourism, the automotive industry and environmental and animal rights groups continue to conduct extensive research. Currently, each road has a warning sign called a wildlife sanctuary or barricade, while major roads have eco-
corridors or fences to prevent animals from jumping into dangerous paths. [4]

3.1 WARNING FLEX

In order to prevent traffic accidents on highways, national regional directorates and governmentaffiliated road direct orates have set up "wildlife tourist areas" signs in areas with frequent road accidents to warn the drivers. Animals live not only in their own living space, but also in their way of moving forward. To mark their territory, wild animal s sometimes bury their distinctive body odor in trees, grass, or streets, or often mark paths leading to urine or feces. Humans have cut the paths animals take, but animals cross paths because they believe it connects like a habit. The animals continue to wander without realizing the dangers that are their territories and their paths.Thus, where accidents occur frequently, accidents can follow one another.

Fig -2 Warning Flex

Likewise, animals continue to work by instinct. However, people paved the way, paved the way and enjoyed civiliza tion. Therefore, the prevention of road accidents must be done by those who injured them. For this reason, people pu t up wild animal signs or warning signs indicating that road accidents can often happen. If drivers turn on their hazar d warning lights whenever they see these signs, they can reduce the frequency of traffic accidents.

3.2 ROADKILL HANDLING METHOD

It is important to try to avoid getting hit. However, accident management after freight accidents is also very importa nt. Indeed, this can lead to a second or third accident when you are in a hurry or panicked. It is essential to know how to deal with road accidents and road accident prevention measures. On the road, cars drive fast, so it is very dan gerous to try to get rid of roadkill carcasses directly.If a traffic accident occurs while driving on the highway, the car should be parked safely on the side of the road, and a tripod or flashing light should be placed 50,100 meters behind to warn vehicles following. Then immediately report the details of the traffic accident to the Korea Expressway Corporation (tel: 1588,504). The government has decided to entrust the investigation of road accidents carried out b y the
Ministry of Environment and the Ministry of Land, Infrastructure, Transport and Tourism to the road management

agencies for unified treatment. Expressways are managed by the Korean Highway Corporation, national highways are managed by the highway government, and provincial highways are managed by local governments. In addition, the continuous management of routes to prevent freight accidents, including the distribution of location,based applications for use by driversCurrently, the government uses Haolu, a locationbased application developed by the Green Alliance, to send information about animal accidents in real time. [5] [6]

3.3 PREVENTION SYSTEM USING SOUND

If the Roadkill sign is for drivers, this intersection is for animals. However, despite these efforts, the number of road accidents continues to rise. It might be a more effective way to avoid being killed if both the handler and the animal can be warned. In this sense, we are studying a road accident prevention system with sound.

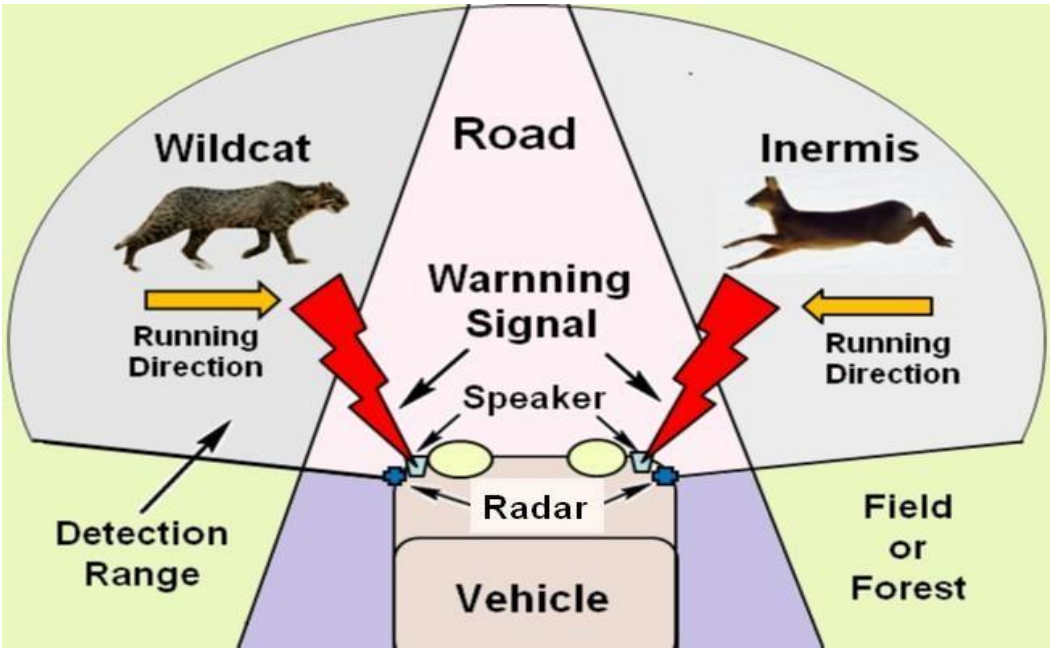

Fig -3 a) Straight road

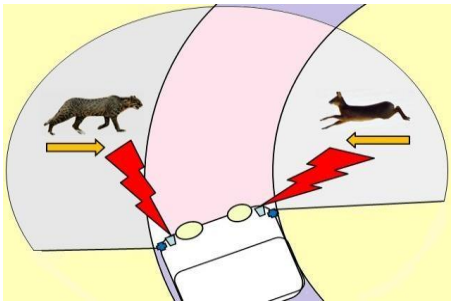

Fig -3 b) Right-hand bend

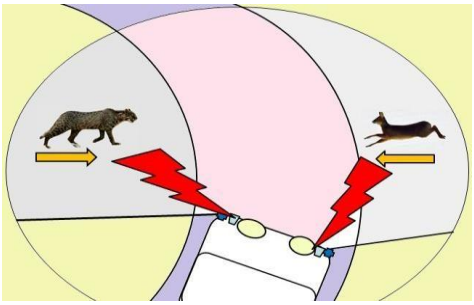

Fig -3 c) Left-hand bend

The soundbased road fatality prevention system is a system that alerts drivers and animals by sending warning signal s at the same time. Road kill warning sound systems can be used to detect speed cameras on vehicles and track the b ehavior of animals moving through fields and woods on both sides of the road. The system alerts the driver to anima ls rushing towards the road and sounds a warning tone to prevent them from approaching. The radar range automatic

ally adjusts to field and forest animals on straight lines and winding roads. Sound sirens are a method of emitting so und frequencies that animals do not like, and increasingly powerful frequencies should continue to be investigated in the future.

4. PREVENTION SYSTEM USING SOUND

Radar is the acronym for Radio Detection and Ranging. It transmits microwave electromagnetic waves to the object in the radar transponder, receives the electromagnetic wave reflected from the object, and calculates the distance, direction and speed of the object. It is a monitoring device without thread. It measures the movement of an object by measuring the reception time of the reflected wave using the direction of the radio wave. The principle applied to radar is linked to the Doppler effect. The Doppler effect, a sound principle discovered by Christian Doppler, was applied in 1842 to sonar equipment and fast guns to measure the depth of the oceans. SONAR (Sound Navigation and Ranging) is an acoustic navigation and ranging system. It is a target detection and identification system such as fish detection and torpedo detection in traps and submarines. However, it can be useful if you use it well in the air. Since the microwaves applied to the radar have a longer wavelength, have the same straightness as light and are not reflected by the ionosphere, the emitted radio waves travel directly towards the target and then reflect.

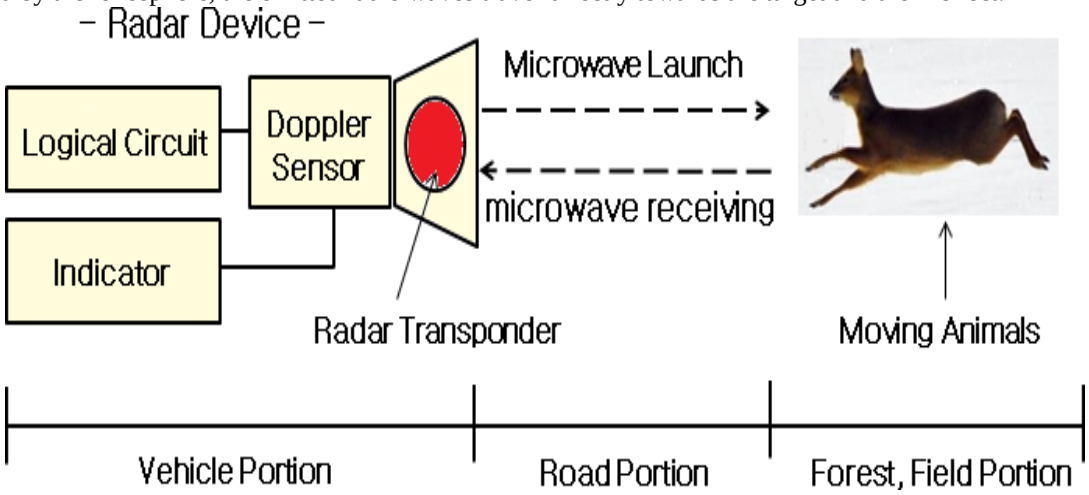

Fig -4 Radar device in load-kill prevention systems

5. CONCLUSION

The importance of life is attributed equally to animals and humans. Humans are destroying animals' living space by destroying nature, including opening roads and developing cities in search of comfortable living. It is important to remember that an environment that is unsustainable for animals can quickly become unsustainable for humans. Perhaps this fatal accident was a preliminary accident of human greed, and the victims were all animals. Now people need to stop being selfish and work hard to create a world where animals can co-exist.

If there is a place where the animal's livelihood is cut off, we must build an underground passage. Also, if there is a disturbed environment, there should be a place for the animal to sit. If you can't build an underpass, you'll need to build a bridge, and if you can't do both, you'll need to put up barbed wire so you don't risk crossing the road. Even with all of these best measures in place, continued human effort is needed to prevent road traffic fatalities.

The sound-using traffic fatality prevention system is a system that detects movement on the road in advance and enters a defensive working mode while issuing a warning sound. First, to identify wild animals approaching the road, a radar is attached to the entire front of the car and detects animal movements. Second, it detects wildlife movement and pre-calculates current vehicle speed and predicted collision points with approaching wildlife to guide the driver at the speed needed to avoid collisions and avoid the impending frequency or hon. . We must treat the animals that live in our country as family with us, and we must work not just with drivers, but with governments, land and road authorities. We need to work on a good early warning system to prevent road deaths and create an environment where animals will live together in the future.

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